

REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars.

1. In the claims

As shown in the foregoing LIST OF CURRENT CLAIMS, the claims have been amended to more clearly point out the subject matter for which protection is sought.

Claims 1 and 2 are amended to clarify that the density information recited in the claims refers to the lightness/darkness of the color/gray scale of the dot, and not to spacing of the dots within a defined area. It is respectfully submitted that no new matter is added, since support for the amendments may be found, for example, at least on page 4, lines 16-19, page 7, lines 3-5, page, 15, lines 20-22, page 19, lines 16-17, page 23, lines 9-23, page 27, lines 5-7 of the accompanying description in the specification as originally filed.

Claims 3-12 are left unchanged.

Claims 3, 5-10, and 12 remain withdrawn from further consideration.

Entry of the LIST OF CURRENT CLAIMS is respectfully requested in the next Office communication.

2. Rejection of claims 1 and 2 under 35 U.S.C. § 102(b) as being anticipated by U.S. patent no. 6,509,548 (*Troitski*)

Reconsideration of this rejection is respectfully requested, in view of the amendments to claims 1 and 2, on the basis that the *Troitski* patent fails to disclose each and every recited element of amended claims 1 and 2.

By way of review, claims 1 and 2 require a laser marking device that irradiates a laser beam on a workpiece in order to transform a portion inside the workpiece at a focal point of the laser beam, thus putting a dot in a predetermined area. An acquiring means acquires two-dimensional position information and density (lightness/darkness) information of the dot.

As discussed in detail in the specification as originally filed (see at least page 4, lines 16-22, page 15, lines 20-22, and page 23, lines 9-23), the density information of a dot is the visually recognized darkness/lightness of the color of the dot, which is different from the three dimensional depth of the dot, or the linear spacing of dots within a predefined unit area. The density of the dot can be adjusted by altering the depth of the dot (specification page 23, lines 20-23).

In claim 1, a coordinate setting means calculates, for each dot, according to the density information, dot depth information, as one of the three-dimensional coordinates, showing the distance from the surface of the workpiece to the dot in the thickness direction of the workpiece. The coordinate setting means further sets three-dimensional coordinates for each dot based on a position that is specified by the dot depth information and the two-dimensional position information acquired by the acquiring means. The laser marking means performs the marking using the three-dimensional coordinates as a laser beam focal point to transform a portion inside the workpiece.

In claim 2, a marking information setting means calculates, for each dot according to the density information, dot depth information showing the distance from the surface of the workpiece to the dot in the thickness direction of the workpiece, and dot diameter information showing the diameter of the dot, sets three-dimensional coordinates for each dot based on a position specified by the dot depth information and the two-dimensional position information acquired by said acquiring means, and sets the dot diameter information for each dot in the three-dimensional coordinates, thereby forming marking information for each dot. The laser marking means performs marking by controlling a marking condition according to the marking information set by said marking information setting means.

The *Troitski* patent discloses a method, systems, and apparatus for generating high-resolution laser induced-damage images inside an optically transparent material (col. 6, lines 25-27). Multiple etch points are used to produce a visible image where the image quality is determined by the spatial resolution and by the number of its gray shades and the image resolution is in direct proportion to the number of etch points of

the unitary area such that more points at the unitary area gives higher resolution (col. 6, lines 42-47). In case of small damages, it is possible to reproduce image gray shades by the variation of the compactness of damage arrangement (col. 6, lines 62-64).

Thus, the *Troitski* patent discloses adjusting the density (lightness/darkness) of the color/gray scale by varying the number of dots that are positioned within a given unit area. There is no disclosure in the *Troitski* patent that the depth of the dots can be varied to adjust the density (lightness/darkness) of the color/gray scale, as is required by the configurations of claims 1 and 2.

The depth of the dots in the *Troitski* patent appears to be arbitrary, and is not calculated based upon the density (lightness/darkness) information of the dot, as is required by claims 1 and 2. In particular, the depths of the dots of the *Troitski* patent appear to be based upon the refractive index of the material, and the desired depth at which the image is to be produced (col. 9, lines 19-21).

Thus, in contrast to claims 1 and 2, which require acquiring the density (lightness/darkness) information of the dot, and calculating the dot depth at least on the basis of the density information, the *Troitski* patent appears to utilize an arbitrary dot depth, independent of the density (lightness/darkness) information of the dot.

Further, with respect to claim 2, the *Troitski* patent also fails to calculate the dot diameter information at least on the basis of the density information. While the *Troitski* patent does disclose determining the linear dimension d_s of an etch point (col. 8, lines 59-61), there is no discussion that this determination is made at least on the basis of the density information, as is required by claim 2.

Accordingly, since the *Troitski* patent fails to disclose acquiring the density (lightness/darkness) information of the dot, and calculating the dot depth at least on the basis of the density information, as is required by claims 1 and 2, or calculating the dot diameter information at least on the basis of the density information, as required by claim 2, withdrawal of this rejection is respectfully requested.

3. Rejection of claims 4 and 11 under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent no. 6,509,548 (*Troitski*) in view of U.S. patent no. 6,207,344 (*Ramlow et al.*)

Reconsideration of this rejection is respectfully requested on the basis that the *Ramlow* patent fails to provide for the deficiencies of the *Troitski* patent, as discussed above in detail with respect to claims 1 and 2, from which claims 4 and 11 respectively depend.

Accordingly, the rejection fails to establish a *prima facie* case of obviousness with respect to claims 4 and 11, and withdrawal of this rejection is respectfully requested.

4. Conclusion

As a result of the amendment to the claims, and further in view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is respectfully requested that every pending claim in the present application be allowed and the application be passed to issue.

Please charge any additional fees required or credit any overpayments in connection with this paper to Deposit Account No. 02-0200.

If any issues remain that may be resolved by a telephone or facsimile communication with the applicant's attorney, the examiner is invited to contact the undersigned at the numbers shown below.

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Respectfully submitted,

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